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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,710	03/23/2004	Maurice Peter Bianchi	03-0418	2668

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EXAMINER	
MERSHON, JAYNE L	

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1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/806,710	BIANCHI, MAURICE PETER	
	Examiner	Art Unit	
	Jayne Mershon	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 April 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4,5,7-16,20-22,25 and 26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,5,7-16,20-22,25 and 26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

Applicant has cancelled claims 3, 6, 17-19, and 23-24. New claim 26 has been added. Currently claims 1-2, 4-5, 7-16, 20-22, 25 and 26 are pending in the application and are considered on their merits below.

Response to Amendment

Applicant's amendment of 4/7/2010 does not render the application allowable.

Status of Objections and Rejections

Previous rejections have been maintained.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112: The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 20-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 20 has been amended to include the negative limitation of "without taking any

measures to correct for lattice mismatch". This is not supported by the Specification. Further, paragraphs [0023] of the Specification discusses measures to take to correct for lattice mismatch. Claims 21 and 22 are rejected as being dependent on claim 20.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. Claims 1, 2, 4 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bianchi (US 6,447,938) in view of Iles et al. (US 6,951,819) as evidenced by Wu et al. ("Superior radiation resistance of InGaN alloys: Full solar spectrum photovoltaic material system", Journal of Applied Physics, volume 94, Issue 10, November 15, 2003) and in view of Sverdrup, JR. et al. (US 2003/0041894)

Regarding claim 1, Bianchi teaches a multi-junction solar cell assembly comprising:

• a transparent substrate, i.e. sapphire substrate and integral cover glass (26 or 36, depending on embodiment).

• a transparent conductive coating formed on the transparent substrate, said transparent conductive coating comprising gallium nitride (GaN) (see col. 4, line 31 through col. 5, line 55 and column 5, line 56 through col. 6, line 59 and col. 7, lines 35-47). Specifically, Bianchi recites two embodiments (see fig. 1 and fig. 3a-3c), which will be used within the scope of this office action. In the first embodiment, the TCC is made up of a series of quantum wells, and in the second embodiment, the TCC has a GaN nucleation layer followed by a lateral overgrowth of GaN.

The limitation to provide a defect-free surface for growing an InGaN solar cell is intended use and, as such, impacts the scope of the claim only to the degree that the limitation results in a structural difference (see MPEP § 2106 II. C). It is the examiner's position that the GaN TCC structure of the two embodiments relied upon in Bianchi are identical to the different embodiments of the GaN TCC of the instant claims and therefore meet the structural limitations of the recitation of intended use.

Furthermore, Bianchi teaches a type III-V solar cell, i.e. GaAs (48), on the TCC, and a metallization layer (52) formed on the final layer of the type III-V solar cell (see col. 6, lines 44-50 and col. 6, lines 60-64). Note: the limitation wherein the layers are grown on the TCC is a product-by-process limitation and as such, the device is not limited to the recited process steps, only the structure (see MPEP § 2113).

Bianchi teaches the substrate and GaN TCC are amenable to being used in applications of solar cells, specifically type III-V (GaAs) solar cells, where lattice mismatch is an issue (see col. 3, lines 41-55).

Bianchi does not teach the solar cell used is a series of tandem solar cells wherein the layers are formed from the III-V compound gallium indium nitride (GaInN), with the cell farthest from the light incident side in the series of tandem cells being indium nitride (InN).

Iles et al. does teach a tandem solar cell wherein the layers are formed from III-V semiconductors, including the family of GaInN (see fig. 6, col. 6, line 58 through col. 7, line 17 and col. 13, lines 49-51).

As evidenced by Wu et al., the GaInN family of semiconductor material used in a tandem cell would include InN based on the desired bandgap of each layer. Wu et al. shows that with the use of InN, the GaInN family can be used to extend the range of the energy gaps for the InN/GaInN family from the deep ultraviolet to the near infrared spectral region, which provides an almost perfect fit to the solar spectrum and allows the design of multi-junction solar cells using a single ternary alloy system (see Wu et al. paragraph 2 on page p.6477).

Although the placement of the InN layer furthest away from the light incident side is not specifically taught, it is an old and well known expedient to arrange the semiconductor layers within the tandem solar cell based on band gap from widest nearest the light incident side to the narrowest furthest away from the light. This would result in the recited order of semiconductor layers (see MPEP § 2144.03).

Iles et al. teach that the group III-V series tandem solar cells have an efficiency higher than single solar cells (see col. 1, lines 21-41). Iles et al. also teach lattice mismatch problems are

present and methods are needed for dealing with the lattice mismatch so tandem solar cells become even more efficient (see col. 1, liens 61-63).

Therefore, it would be obvious to a person having ordinary skill in the art to modify the solar cell layers within Bianchi with the tandem solar cell layers taught by Iles et al. from GaInN and InN because the tandem solar cell layers are more effective than single solar cells and the GaInN family of semiconductors, including InN, can be modified to extend nearly over the entire solar spectrum.

The combination of Bianchi and Iles et al. do not specifically teach wherein each successive gallium indium nitride junction layer has a thickness greater than a thickness of the immediately preceding gallium indium nitride junction layer.

Sverdrup, Jr. et al. teach the photoactive layer thickness influences the percentage of incoming light absorbed by the layer. The coefficient of optical absorption varies as a function of the wavelength of light. Therefore, a photoactive layer that is designed to absorb the longer wavelengths of light would require a thicker layer in order to capture the same percentage of light when compared to a photoactive layer designed to absorb the shorter wavelength of light (see paragraph [0059]). The result of this teaching is that the wide bandgap semiconductor layers that are designed to absorb the higher energy, shorter wavelengths do not require the same thickness as the narrow bandgap semiconductor layers that are designed to absorb the lower energy, longer wavelengths in order to absorb the same percentage of energy entering the semiconductor layer, i.e. the layers closest to the light incident side are thinner than the layers furthest from the light incident side.

Therefore, it would be obvious to a person having ordinary skill in the art to modify the GaInAs family of semiconductor layer taught by Iles et al. to have an increasing layer thickness with each successive semiconductor layer with the thinnest layer nearest the light incident side of the solar cell.

Regarding claim 2, the combination of Bianchi and Iles et al. teach a multi-junction solar cell assembly wherein the transparent substrate (26, 36) is sapphire, ZnO, or GaN (see Bianchi col. 3, lines 41-45 and col. 5, line 53). See discussion in claim 1 regarding each embodiment of Bianchi.

Regarding claim 4, the combination of Bianchi and Iles et al. discloses a multi-junction solar cell assembly further comprising a gallium nitride junction layer (col.4, lines 45-48 and col. 7, lines 7-14) between the transparent conductive coating and the plurality of gallium indium nitride junction layers (see Bianchi col. 4, lines 31-65). See discussion in claim 1 regarding each embodiment of Bianchi.

Regarding claim 15, the combination of Bianchi and Iles et al. teach a multi-junction solar cell assembly wherein the transparent conductive coating comprises a gallium nitride layer (40 and 46) formed on the transparent substrate (see Bianchi col. 5, line 56 through col. 6, line 17). See discussion in claim 1 regarding each embodiment of Bianchi.

3. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iles et al. (US 6,951,819) as evidenced by Wu et al. ("Superior radiation resistance of InGaN alloys: Full solar spectrum photovoltaic material system", Journal of Applied Physics, volume 94, Issue 10, November 15, 2003) in view of Bianchi (US 6,447,938).

Regarding claim 20, Iles et al. teach a method of forming a solar cell comprising:

growing a solar cell including a plurality of gallium indium nitride junction layers on a substrate without taking any measures to correct for lattice mismatch (see col. 4, line 44 through col. 5, line 35; col. 6, line 31 through col. 7, line 17; and col. 13, lines 49-50). The goal of Iles et al. of having a sub cell in the range of 0.95 to 1.05 eV (see Iles et al., col. 1, lines 38-39), is met by the ability of GaInN to span the range of 0.7 to 3.4 (see Wu et al., page 6477, top of second column).See discussion of using GaInN as the semiconductor layers in the structure of Iles et al. as evidenced by Wu et al. in claim 1 above.

Iles et al. does not teach the layers of gallium indium nitride junction layers are grown on a transparent conductive coating, nor does Iles et al. teach the substrate is a sapphire cover.

Bianchi does teach growing semiconductor layers for a solar cell on a transparent conductive coating including gallium nitride, which has been formed on a sapphire cover (see col. 4, line 31 through col. 5, line 55 and column 5, line 56 through col. 6, line 59 and col. 7, lines 35-47). Also see discussion of embodiments in Bianchi in claim 1 above.

Iles et al. teach that lattice mismatch reduces the solar cell efficiency (see col. 1, lines 37-47). Bianchi teaches that substrates for reverse structure growth as taught by Iles et al. are expensive and removal of the substrate results in the requirement for a separate cover rather than the integral sapphire cover. The TCC of Gallium nitride on a sapphire cover taught by Bianchi allows for an integral cover and a less expensive manufacturing method (see col. 2, lines 40-51).

Therefore it would be obvious for a person having ordinary skill in the art to modify the method of GaInN semiconductor layers taught by Iles et al. by growing the layers on the integral sapphire cover and TCC taught by Bianchi because the TCC does not propagate defects due to

lattice mismatch into the semiconductor layers resulting in a less expensive manufacturing method of high efficiency solar cells.

Regarding claim 21, the combination of Iles et al. and Bianchi teach a method further comprising forming a metallization layer on the plurality of gallium indium nitride junction layers, wherein the metallization layer is selected from a group that includes a layer of aluminum, chromium or titanium (see Iles et al. col. 7, lines 63-65 and col. 13, lines 29-32 and Bianchi col. 6, line 60 through 64).

The recitation of claim 21 that a layer of indium nitride junction is formed on the plurality of gallium indium nitride junction layers between the metallization layer and the plurality of gallium indium nitride junction layers is recited in claim 1. See rejection of claim 1 above.

Regarding claim 22, all the limitations of claim 22 are recited in claim 4. See rejection of claim 4 above.

4. Claims 25, 5, 7-14, 16 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bianchi (US 6,447,938) in view of Iles et al. (US 6,951,819) and Wu et al. ("Superior radiation resistance of InGaN alloys: Full solar spectrum photovoltaic material system", Journal of Applied Physics, volume 94, Issue 10, November 15, 2003).

Regarding claim 25, all the limitations of claims 25 are recited in claim 1. See rejection of claim 1 above.

Regarding claim 5, Iles et al. as evidenced by Wu et al. teach wherein a plurality of gallium indium nitride junction layers have a thickness of .24 microns, i.e. 240 nm, which is between 0.2 microns to 1.0 microns (see Wu et al. page 6478, second column, top paragraph).

The court has ruled that a specific example in the prior art which is within a claimed range anticipates the range (see MPEP § 2131.03 I).

Regarding claim 7, Iles et al. as evidenced by Wu et al. teach wherein each layer of the plurality of gallium indium nitride junction layers has a gallium content and indium content as follows: $In_{1-x}Ga_xN$, where x is up to 0.32, and $In_{0.08}Ga_{0.92}N$. Each of these are in the weight percent of the recited range of gallium 90 to 10% by weight and Indium 90-10% by weight. For example, in the first formula at x=.032, In is ~68% and Ga is ~22.4% and in the second formula In is ~10.2% and Ga is ~74%

The court has ruled that a specific example in the prior art which is within a claimed range anticipates the range (see MPEP § 2131.03 I).

Regarding claims 8 and 10, the combination of Iles et al. and Wu et al. do not teach wherein the gallium content decreases in each layer with the greatest content nearest the light incident side and the least furthest from the light incident side (claim 8) or wherein the bandgap goes from widest at the light incident side to narrowest at the layer furthest from the light incident side.

It is an old and well known expedient that in a tandem solar cell, the layers nearest the light have the widest bandgap, i.e. absorb the highest energy with the shortest wavelength, and the layers furthest from the light incident side have the narrowest bandgap, i.e. absorb the lower energy with the longest wavelength (see MPEP § 2144.03).

Furthermore, Iles et al. teach wherein a person skilled in the art would be able to adjust the layer thickness, layer composition, and dopants to achieve the properties desired through an iterative process (see col. 9, lines 31-48).

Therefore it would be obvious for a person having ordinary skill in the art to modify the indium and gallium content in the each successive layer taught by Iles et al. to have decreasing gallium and increasing indium as the layers are further removed from the light incident side because the layers in a tandem solar cell function best when the band gap is widest in the layer nearest the light incident side and narrowest in the layer furthest from the light incident side.

Regarding claim 9, Wu et al. teach wherein layers of gallium indium nitride have a band gap in the range of 0.7eV to 3.4eV (see Wu et al., page 6477, top of second column).

Regarding claim 11, Bianchi teaches a solar assembly wherein the transparent conductive coating comprises: a nucleation layer (37) formed on the sapphire cover (36); a lateral epitaxial overgrowth layer of gallium nitride (44) formed on the nucleation layer; and a defect-free gallium nitride layer (46) formed on the lateral epitaxial overgrowth layer (see col. 5, line 56 through col. 6, line 36).

Regarding claim 12, Bianchi teaches a solar cell assembly wherein the nucleation layer (37) comprises: an aluminum nitride coating formed directly on the sapphire cover in intimate contact with the sapphire cover; and a seed layer of gallium nitride formed on the aluminum nitride coating (see col. 5, line 59 through col. 6, line 3).

Regarding claim 13, Bianchi teaches a solar cell assembly wherein the transparent conductive coating comprises: a plurality of alternating layers of gallium nitride and aluminum gallium nitride; and a plurality of quantum wells (22), each quantum well of the plurality of

quantum wells formed at a corresponding interface between adjacent layers of gallium nitride and aluminum gallium nitride of the plurality of alternating layers of gallium nitride and aluminum gallium nitride (see col. 4, lines 31-48).

Regarding claim 14, the combination of Bianchi teach a solar cell assembly wherein the photoactive layer of a solar cell is formed directly on a last gallium nitride layer of the plurality of alternating layers of gallium nitride and aluminum gallium nitride in intimate contact with the last gallium nitride layer of the plurality of alternating layers of gallium nitride and aluminum gallium nitride (see col. 6, lines 52-64). Although the photoactive layer is shown on the alternate embodiment, Bianchi indicates the embodiments are exchangeable (see col. 3, lines 41-44).

Bianchi does not teach the photoactive layer of the solar cell is a tandem cell comprising layers of gallium indium nitride.

Iles et al. does teach a solar cell wherein the solar cell is a tandem cell with the tandem cells comprising a plurality gallium indium nitride junction layers. See claim 25 for discussion of obviousness.

Regarding claim 16, Bianchi teaches a solar cell assembly further comprising a metal current collector bus (54) for receiving electrical power collected from the photoactive layers (see col. 6, line 60 through col. 7, line 6)

Bianchi does not teach the photoactive layer of the solar cell is a tandem cell comprising layers of gallium indium nitride.

Iles et al. does teach a solar cell wherein the solar cell is a tandem cell with the tandem cells comprising a plurality gallium indium nitride junction layers. See claim 25 for discussion of obviousness.

Regarding claim 26, the combination of Bianchi, Iles et al. and Wu et al. teach wherein the TCC is formed as a plurality of quantum wells (see discussion of embodiment 1 of Bianchi in claim 1 above). Further the combination teaches wherein the InGaN solar cell is in intimate contact with the GaN layer (see obviousness discussion of claim 1 above). It is the examiner's position that "the InGaN solar cell" encompasses all layers making up a solar cell including graded layers, super lattices to account for lattice mismatch, hole transport layers, electron transport layers, electron injection layers, hole injection layers, any type of photoactive layers, including pn junction layers, p-i-n junction layers, quantum well active layers, any type of reflection layers, etc. A solar cell is the entire cell, not just the photo-active layer. It is further the examiner's position that the TCC acts as an electrode and therefore is necessary to be in intimate contact (see Iles et al. col. 8, line 55 through col. 9).

Response to Arguments

Applicant's arguments filed 4/7/2010 have been fully considered but they are not persuasive.

Applicant combines arguments for base claims 1, 20 and 25 (see applicant's remarks page 8 and 9). Base claims 1 and 25 have the limitation for a transparent conductive coating of GaN, which is "defect free" and is for growing an InGaN solar cell. Base claim 20 does not have a requirement for a "defect free" transparent conductive coating, but does have the requirement that a plurality of gallium indium nitride junction layers are grown on a gallium nitride transparent layer "without taking any measures to correct for lattice mismatch".

It is the examiner's position that the limitation for providing a "defect free" gallium nitride TCC (claims 1 and 25) is significantly different than growing successive layers of a gallium nitride layer and gallium indium nitride junction layers which are lattice matched (claim 20).

Regarding claims 1 and 25, per applicant's specification, forming a "defect free" TCC involves a process that accounts for the lattice mismatch between the substrate and the GaN TCC (see applicant's instant specification paragraphs [0020]). The examiner used Bianchi to teach a "defect free" TCC, i.e. a GaN TCC where the lattice mismatch between the substrate and TCC is accounted for in the exact same manner as in applicant's current specification (see Bianchi cols. 2-7 and applicant's specification paragraphs [0014]-[0020]). Therefore applicant's argument that the combination of Bianchi and Iles does not teach a "defect free" GaN surface as specified in claims 1 and 25 is not persuasive.

Further, applicant states the GaN layer is not taught as being "for growing" an InGaN solar cell. This is intended use. See discussion for claim 1 above. Claim 1 and 25 do have a limitation for "a solar cell including a plurality of gallium indium nitride junction layers grown successively on the transparent conductive coating" (claim 1) or alternatively wherein an InGaN solar cell is grown on the "defect free" GaN surface (claim 25). Both claims use the term comprising meaning layers to account for lattice mismatch between the "defect free" GaN surface and the solar cell is within the limitation of the claim language.

In Bianchi, the prior art discloses that the transparent substrate and GaN TCC is effective for growing solar cells from the light incident side to replace prior art methods known as "the reverse process" taught by Iles, i.e. where the solar cells are grown on a growth substrate from

the light incident side, the growth substrate removed and a cover glass placed on the upper cell (see Iles. col. 2, lines 29-34 and instant application paragraph [0002]). Therefore, Bianchi teach forming the solar cell on the GaN TCC is an alternative for forming the solar cell on a growth substrate, i.e. the method of Iles. The examiner states the motivation for using the InGaN solar cell of Iles in place of the GaAs solar cell of Bianchi is that Iles et al. teach that the group III-V series tandem solar cells have an efficiency higher than single solar cells (see Iles col. 1, lines 21-41).

Applicant does not argue against the motivation for growing InGaN instead of GaAs, but argues the prior art separately. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Regarding claim 20, applicant states that in Bianchi, corrective measures are taken to grow a GaAs layer on to the GaN TCC (see applicant's remarks page 8). Specifically applicant notes that the corrective measures taught by Bianchi are one of 1) a layer of indium gallium phosphide, 2) use of a super lattice, i.e. quantum wells, 3) a graded layer, or 4) an offset method). It is the examiner's position that the applicant's specification uses two of these same methods to take corrective measures.

First, one of the methods for forming a defect free GaN TCC is through the use of a super lattice or quantum well (see first embodiment of Bianchi discussed in claim 1).

Second, the applicant teaches a grading method wherein if the layer next to the GaN TCC is a GaN junction layer and the first layer of GaInN has a high enough concentration of gallium, the mismatch can be minimized (see applicant's specification paragraph [0023]).

Therefore, applicant does take further steps to minimize lattice mismatch and such steps are similar to those taught in Bianchi.

Regarding applicant's argument regarding the § 112 rejection, see discussion of claim 20 above. Regarding applicant's argument of claim 26, see new grounds of rejection above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jayne Mershon whose telephone number is (571) 270-7869. The examiner can normally be reached on 9:00 AM to 5:00 PM; alt. Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer Michener can be reached on (571) 272-1424. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jennifer K. Michener/
Supervisory Patent Examiner, Art Unit 1795

JLM
6/21/2010